

Chapter 7

Evaluation of Response Reliability

Introduction

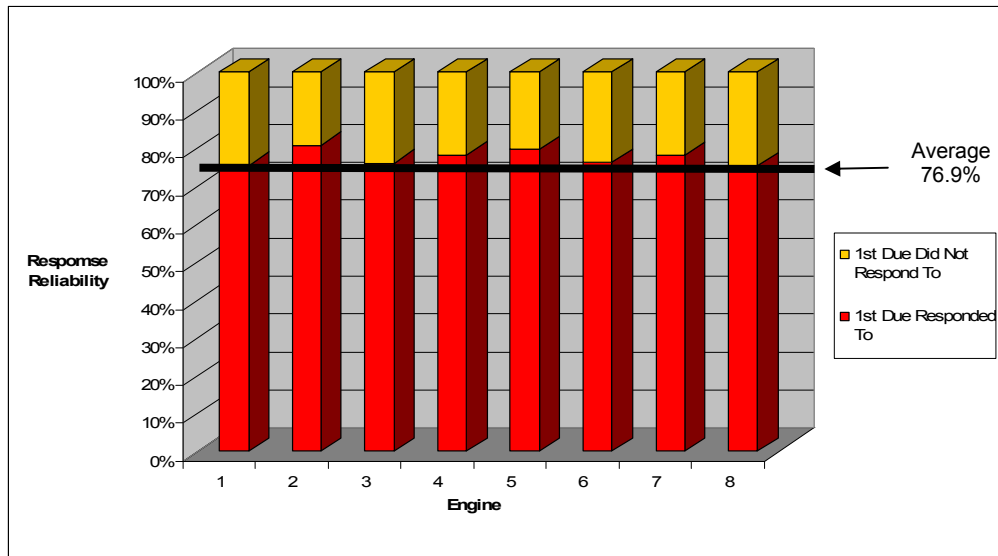
Response reliability is the probability that the resources assigned to a territory will be available to respond from within that territory when an emergency occurs in that area. Response reliability would be 100 percent if every company were available in its station when a fire or emergency call is received. In reality, there are times a call is received when the first-due company is out of area or unavailable. This requires that a later-due company, in the pre-determined response order, be assigned the response. If the later-due company is too far away, the call cannot be handled within the desired total reflex time.

As the number of emergency calls per day, training demands, and other routine activities (such as taking apparatus to the repair shop) increase, so does the probability that the first-due company will be out of area or unavailable when a call is received (decreased reliability).

Constraints in the existing Computer Aided Dispatch (CAD) system limit the ability of the LF&EMS to easily isolate and analyze which calls could not be handled by the assigned first-due company. To present the total picture, we have analyzed the number of calls that were *not* handled by the first due company.¹ Data covering FY02 through FY04 are included to compare reliability rates of units.

¹ A call might be handled by other than the first due company when the other company was “passing through” the area, relocated for training, or for a variety of other reasons.

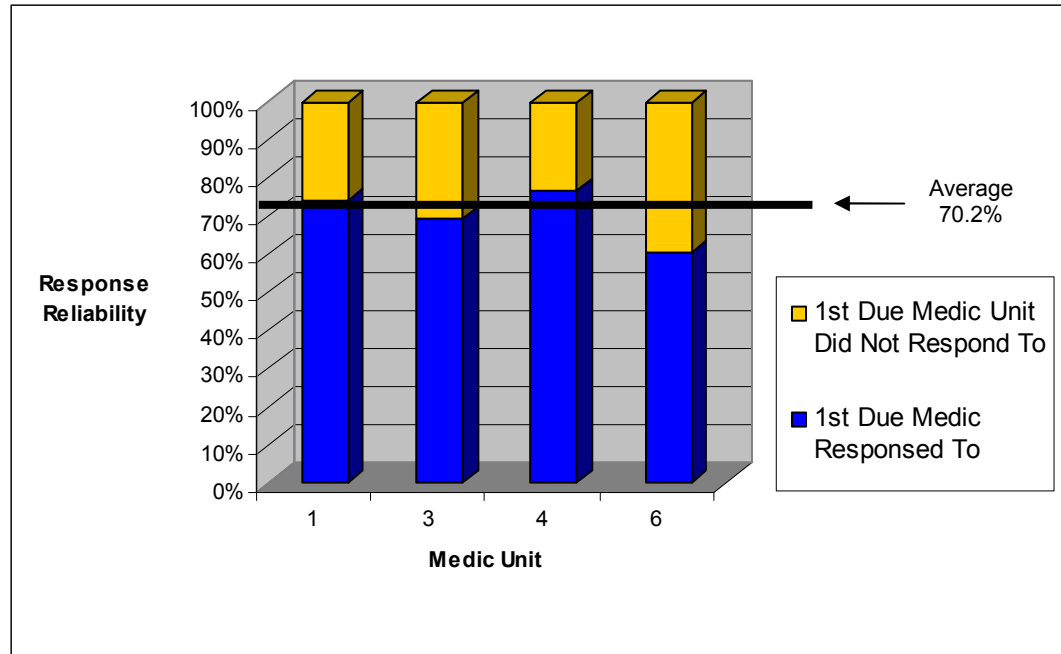
Figure 7.1 Analysis of Response Reliability By First Due Engine: 2004-2004



As shown in the above graph, four of the eight engines fall below the average response reliability of 76.9 percent. Engines 1 and 6 has a lower than average response reliability for several reasons, but primarily because these are the engines that are placed out of service when staffing levels fall below minimums. Additionally, when Engine 6 is out of service it misses a greater number of calls than do other engines when they are out of service. However, the concentration of engine resources around Station 6 provides for coverage. Additionally, with Engine 6's high call volume, there is a greater possibility of multiple calls being received at concurrent times. Engines 3 and 8 also have low response reliabilities, which is evidence of the ever-increasing call volume as a result of development within Engine 3 and 8's service areas. With the higher call volume, there is the higher probability that Engine 3 and 8 will already be on another call.

The actual response reliability for each engine company and each response zone is included in the attachments section of this document.

Figure 7.2 **Analysis of Response Reliability By First Due Medic Unit: 2002-2004**



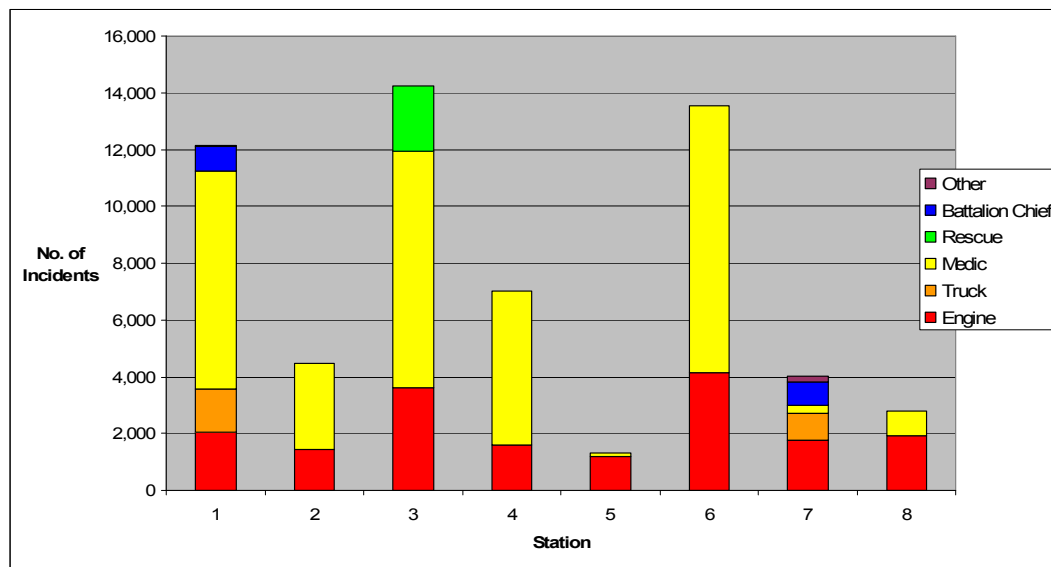
As shown in the graph above, the average response reliability for the four emergency medic units assigned to 24-hour shifts is 70.2 percent. Two medic units, Medic 3 and Medic 6 fall below the average. The actual response reliability percentage is inversely proportional to the call volume for each of the medic units (i.e. Medic 6 has the highest call volume, but has the lowest response reliability). Medic 4 has the highest response reliability at 76.8 percent, followed by Medic 1 with 74 percent. Medic 3 has a response reliability of 69.4 percent and Medic 6's response reliability is 60.6 percent.

The actual response reliability for each medic unit and for each response zone is included in the attachments section of this document.

Company Workload

The following chart illustrates the annual distribution of calls by type of apparatus by station. This chart shows the stations with the most calls, as well as those with multiple pieces of response apparatus. This information, coupled with response reliability data, lets LF&EMS further analyze resources distribution and workload issues.

Figure 7.3 **Run Distribution By Type of Apparatus: 2002-2004**



As seen in the above three (3) year figures, the three busiest stations are Station 3, Station 6, and Station 1. Station 1 responded to approximately 12,200 calls for service in 2002 to 2004 (4,052 per annum) when combining all six pieces of apparatus assigned to the station. Station 3 responded to 14,223 calls for service in 2002 to 2004 (4,741 per annum) when combining all three pieces of apparatus assigned to the station. However, Station 6 responded to just over 13,500 calls for service in 2002 to 2004 (4,514 per annum) when combining the engine company and medic unit assigned to the station. Activities beyond an average of 3,000 calls per year usually show significant impact on response times, company availability and fire fighter fatigue.

Stations 3 and 6 continue to be the busiest stations within LF&EMS. While Station 6 has a large call volume within its own first-due response areas, its central location makes it second-due in many other areas and the units assigned there often respond to calls for service in other response areas when the first-due units are unavailable.

Some companies exhibited a low run volume, including 2, 4 and 5. However, these stations are located in highly residential areas and have historically low call volumes. Stations are needed in these areas to ensure quick response during all

times of the day, although there is some significant overlap in travel time capabilities in Station 2 and 4's response areas by Stations 1 and 6.

Performance Measurement and Quality Assurance

By its very nature, the organized response to emergencies is performed in a stressful and inherently unpredictable environment. Critical decisions must often be made quickly, without the benefit of a methodical risk-benefit analysis. Given this, it is expected that errors will sometimes occur. LF&EMS consistently seeks to use its performance measures as opportunities to learn how we can improve our service and to adjust our policies and procedures accordingly.

Fire Suppression and Rescue Operations

An integral component of quality assurance is the use of post-incident evaluations by the department. Conducted at the discretion of the shift Battalion Chiefs, these are focused reviews following major incidents, and for any incident involving fatalities or a serious injury, a unique operational situation, or a multi-agency response. They involve all responding personnel as well as the leaders from the affected organization(s). Less serious, routine incidents and events are also sometimes evaluated at the company level. Post-incident evaluations consider the following criteria:

1. System strengths or weaknesses
2. Factors driving operational decisions
3. Standard Operating Procedures
4. Apparatus and equipment effectiveness
5. Education and/or training needs
6. Building construction factors
7. Unusual circumstances
8. Human factors that contributed to the problem

Emergency Medical Services

A quality assurance program, of sorts, has been in place for a number of years for the analysis of the emergency medical services provided by the department. It is the practice of LF&EMS to regularly participate in activities that lead to the development and maintenance of establish levels of high quality patient care and customer service, as well as activities that seek to improve the overall level of care.

Each patient care report is reviewed by “chart reviewing” Captains or Master Firefighters on each shift. The majority of their work consists of ensuring the report is complete in terms of required elements. However, these reviewers also may question providers on the procedures performed/not performed during the call for service. Further action can be taken by referring providers or charts in question to the EMS Training Captain or the EMS Battalion Chief for further review.

Another significant form of quality assurance is the now annual EMS skills review for all EMS providers. Providers are monitored during skills review sessions in the late winter.

LF&EMS is anticipating the implementation of a “formal” quality assurance program under the direction of a Quality Assurance Captain. This position was included in the FY2006 budget and will be filled in January 2006.